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shadow of the coming task always falling upon the task just finished. The gentle, obedient, loving, and affectionate little ones suffer; while the dear bad boys won't even make an effort, and thrive accordingly. The teacher can sometimes go home with his work finished for the day; the pupil never.

Now, if I will not permit this wrong to be perpetrated in the school under my charge, you take your boy away and send him to Mr. Examination Hunter's school; and you take your girl out of Miss Honest's department and send her down to Miss Show-off's school; and then you point with parental pride to the great load of books your little ones stagger under, as a proof of the superior efficiency of those two principals "whom we all respect." Then, when your little girl graduates, and Miss Show-off orders all the graduates to wear white dresses and tea-roses, and to come in carriages, and to drape their desks in white, you all say, "She has no right to give any such orders, and it ought to be stopped, and" — You get the dresses and the tea-roses and the carriage, and you attend the reception; and it is all so beautiful, and the members of the mutual admiration society do speak so mellifluently, — buttered honey, as it were, — that you are as proud of your daughter as a drum-major on parade. And then you go home, and your daughter has typhoid-fever, or spinal meningitis, or some other Latin disease, and you lay the blame on Providence. Who is to blame if the supply of sham education be exactly proportioned to your demand for it?

If you could only once be roused from your apathy on this subject, do you not know that your servants — the mayor, the Board of Education, and the Legislature of this great State of New York — would skip around like waiters in a dime restaurant to get you what you want?

The press has at last taken hold of this matter for you. How many of you will read what is written in your interest, and how many more will skip it all in order to read about the latest baseball match or the last prize-fight? If you, happily, by any chance, have read thus far without throwing down the paper, will you kindly read the summing-up of the whole matter? The public schools of New York City will never be any better than the people of that city demand that they shall be.

EDWARD H. BOYER,  
*Principal Grammar School 9.*

#### Reflex Speech.

NOTING the paragraph in *Science* of May 25, quoting from the *Journal of Mental Science* a statement of experiments in reflex speech, it seemed to me that certain experiences of my own in reflex writing might be of interest. I compose and write with considerable rapidity, and, on re-reading my manuscript, often find that my hand has written words in opposition to the orders from my mind. Of the several words beginning with *th*, for instance, 'the' is often written where 'they,' 'this,' or some other word, was intended. In like manner 'their' becomes 'there'; 'whether' takes the form of 'where'; 'while' replaces 'which,' 'what,' etc.; and other vagaries of the same general character now and then appear. Probably experiences of this kind are common, and are passed over without reflection as to their cause. They have long seemed to me evidences of reflex action. In rapid composition, the writing hand lags behind the conscious thought, which springs on to the words in advance, and leaves its successive orders to be executed in an automatic and unconscious fashion.

Ordinarily the wheels of the brain roll on in due order; but occasionally the hand seems to take the task of suggestion on itself, taking advantage of the absence of consciousness, and moving in a more customary channel than that directed: *th*, for instance, is followed by *e* more commonly than by any other letters; and the hand, if left to the action of reflex suggestion, would write 'the' in preference to the other *th* words. It is not at all surprising, then, that the writing of *th* sends back a reflex suggestion of *e* as the concluding letter of the word, which is occasionally of sufficient strength to overcome the impulse given by consciousness to the brain to write some other word.

It may be, however, that this phenomenon is due to relations of the nervous system different from those ordinarily estimated, and that the brain has nothing to do with the dereliction of duty in the

hand. I should suggest the following theory in explanation of the phenomenon. The brain does not differ in physical formation from the inferior ganglia, and may not differ in its power of memory-recording. The impulses which pass along the sensory nerves to the brain traverse several ganglia on their way thither, and may leave memory traces in each of these as well as in the brain. The impulses to motion emanating from the brain similarly pass through inferior ganglia, and may produce in them conditions similar to those affecting the brain at that instant. But when the consciousness has brought the brain into condition to produce certain successive effects, this condition does not exist in the inferior ganglia. In writing the letters *th*, for instance, two influences are at work. There are influences descending from the brain to produce certain succeeding motions in the fingers; and there are sensory influences flowing upward from the moving fingers which are full of reflex suggestiveness. It seems not improbable, then, that this reflex suggestion may now and then call forth a response from an inferior ganglion, and thus check the action of the brain, which, in its unconscious automatism, may need a reflex influence from the fingers to bring it into condition to complete the word.

If such be the case, we can readily understand why the more ordinary words beginning with certain letters are occasionally written, instead of those dictated by consciousness, which begin with the same letters. It may perhaps be that the work in both cases is done by the brain, and yet this hardly seems probable: for the brain is put in train to perform a certain duty, and its tendency to do this seems likely to be stronger than any reverse tendency to perform a more customary action. This reverse tendency may undoubtedly occasionally gain precedence; but, if the inferior ganglia have the capabilities above suggested, it is not improbable that the reversing influence comes from them, and that the precedence which the brain possesses while in conscious activity may weaken during unconsciousness, so that, if the reflex influence from the hand arouses all the ganglia through which it passes to activity, an inferior ganglion may occasionally win in the conflict with the brain, and take control of the reins of action. C. MORRIS.

Philadelphia, Penn., June 5.

#### Answers.

32. HUMAN BEINGS AS PACK-ANIMALS. — Prof. Joseph Le-Conte of the University of California sends the following information in reply to an inquiry in *Science* in reference to the strength and endurance of the human pack-animal. I shall be extremely obliged for many notes of this kind from every part of the world. "In 1844 I travelled by birch-bark canoe something like a thousand miles, from Lapoint over to the head waters of the Mississippi, and down the latter to Fort Snelling, at mouth of Minnesota River. We made several portages, the longest being nine miles. We had along two trunks, and provisions and bedding for four persons for one month. The load which our two *voyageurs* carried was certainly one hundred and fifty to two hundred pounds each. They made seven miles in one day, going over the ground five times; i.e., thirty-five miles. Three fifths of the distance they were loaded, and two fifths going back for another load. Their plan was to take the heaviest load first (about two hundred pounds), and carry it about a mile or a mile and a half, put it down, go back for another load of one hundred and fifty pounds, carry this a mile or a mile and a half beyond the first deposit, then come back, take up the first deposit and carry it the same distance beyond, etc., until all was carried to the camp for the night; then, last of all, they went back seven miles to the last camp, took up the boat (which was the lightest load of all), and carried it to camp. I will give an account of one load. They used a leather strap about two inches and a half wide in middle, and slenderer towards the end, and perhaps ten or twelve feet long. One fellow, a famous *voyageur*, would tie this about my trunk (about seventy-five pounds) in two places near each end, and throw it over the head, bringing the band across the forehead, the trunk resting on the back, then take a hundred pounds of flour and put on the trunk, and then twenty-five pounds of crackers on top of all, and walk off briskly, almost in a trot. The man was not a large or very muscular man, but rather lean and wiry."

O. T. MASON.

Washington, D.C., June 5.